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BOOKS ON OCEANOGRAPHY





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FOREWORD

To most people oceanography is associated with popular television documentaries and movies showing scuba divers and their dramatic underwater explorations. While the subject is exciting and rewarding, oceanography is somewhat less glamorous than these underwater adventures. It is characterized by painstaking, methodical research by dedicated scientists aboard ship, in the library, in the laboratory and at the desk. It attracts people from all walks of life, but relies heavily on the talents and interests of physicists, chemists, biologists, zoologists, geologists, hydrographers, mathematicians and engineers. Its importance is also recognized as man looks to the sea for resources, appreciating the fundamental role which the oceans play in maintaining the well being of our planet.

This booklet has been prepared in response to questions received from hundreds of persons whose curiosity has been aroused in the subject of oceanography. It is meant to provide such people with an idea of the depth and scope of oceanography and an indication of where introductory literature on the various elements of the subject can be found.

Dr. George L. Pickard, Professor of Oceanography at the University of British Columbia, prepared this bibliography under contract with the Department of Fisheries and Oceans.



Introduction

The list of Introductory Books is in alphabetical order (author's name) with author, title, publisher and date, number of pages (to give you some idea of the size of the book), and a brief statement about the character of the contents of the book. To the right of each title are three further symbols indicating:

- (1) Style: N = Narrative, T = Textbook, P = mostly pictures;
- (2) Level: 1 = School, 2 = University (1st or 2nd year),
3 = University (3rd or 4th year);
- (3) Subjects covered: Al = All; Bi = Biology; Ch = Chemistry; Ge = Geology
Hi = History; Pe = People; Ph = Physics; Po = Pollution; Re = Resources;
Te = Technical (instruments, SCUBA, submersibles, etc.).

To assist you to locate books about a particular subject, there is a list (after this introduction) to indicate which subjects may be found in which books, each book being identified by the initial letter of the author's name (or first author's name if there are two or more) and its number within that letter group, e.g. B.2 = Barber, N.F. = *Water Waves*.

The 'level' symbol is to give a rough idea of the educational level (in science) of the readership at which it is aimed; it may help you to choose your initial reading in Oceanography. If you wish to go further, then try a higher level. For example, a junior school reader would probably start with "level 1" books but a high school senior interested in science and wanting more detail might try "level 2" or even "level 3" books. (For a university science student who wishes to determine the kind and level of subjects being studied by professional oceanographers, there is a short list of more advanced texts at the end of this brochure. These texts are listed in chronological order of publication.)

Please note that this bibliography does not claim to list every text ever published on oceanography or marine science — it is simply intended to give you some titles to help you get started. If you find other books that interest you, then read them — the fact that they are not in this list does not mean that they are not useful or interesting. Also, most books have lists of books for further reading and/or lists of references from which their subject matter was obtained. Such lists may supplement the present one.

Note that most encyclopaedias have articles on oceanography and there is no point in trying to list all the articles or encyclopaedias. Look up subjects such as 'oceanography, marine biology, marine geology, etc.' or other subjects in the titles of the books in this list. Very often an article on one topic will have cross-references to related topics in the same encyclopaedia. Most encyclopaedia articles are written by experts and are reliable. (The 'New Canadian Encyclopaedia', which was prepared in 1983, has a considerable number of articles about oceanography, some general but most about topics of particular relevance to Canada and Canadian seas — all written by Canadian experts.)



Some periodicals which have articles written by experts for non-technical readers are:

Oceans — published by the Oceanic Society, Des Moines, Iowa.

Oceanus — published by the Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.

Scientific American — has articles from time to time on marine topics.

Sea Frontiers — published by the International Oceanographic Foundation, Miami, Florida.

WHERE TO FIND MATERIAL ON SPECIFIC SCIENTIFIC DISCIPLINES IN THE FOLLOWING LIST OF BOOKS

(Remember that 'Al' books have material on
biology, chemistry, geology and physics.)

- All : A.2, A.3, A.4, B.9, B.10, C.5, C.8, D.1, D.2, D.6, E.1, E.3, F.1,
(Al) F.4, G.7, G.8, H.10, I.3, K.4, L.2, M.5, M.11, P.4, R.2, R.6,
S.2, S.6, S.14, T.3, T.6, V.1, V.3, V.4, W.2, W.3, Y.1.
- Biology : B.3, B.4, B.5, C.1, C.2, C.3, C.5, C.9, F.2, F.3, F.6, H.2, H.4,
(Bi) H.7, H.8, I.1, I.2, I.4, L.1, L.4, M.6, O.1, R.3, R.4, R.5, R.10,
S.7, T.1, T.2, T.5, V.5, V.6,
- Chemistry : B.12, H.2, T.8.
(Ch)
- Geology : A.1, B.5, B.6, B.7, C.6, D.7, F.3, G.1, G.2, G.5, H.5, H.6, K.1,
(Ge) K.3, K.5, M.2, M.4, M.8, M.9, P.2, P.3, R.1, S.4, S.5, S.11,
T.4, T.8.
- History : D.2, D.3, D.4, D.6, H.1, H.10, I.3, L.3, M.3, S.1.
(Hi)
- People : B.8, B.9, D.3, E.1, M.8, P.2, R.1, R.2, S.2, S.6.
(Pe)



Physics : A.1, B.1, B.2, B.7, B.11, C.2, C.4, C.6, C.7, D.5, D.7, E.2, G.3,
(Ph) G.6, H.1, H.3, H.7, H.9, L.1, M.1, M.7, M.10, P.1, P.5, P.6,
R.9, S.11, S.13, T.4, T.7, T.8, V.2, V.6, W.1, W.4,
W.5, W.6.

Pollution : C.1, D.1, D.7, F.4, I.4, M.12, R.7, S.8, T.1.
(Po)

Resources : B.3, B.4, B.10, C.3, E.2, F.3, H.11, I.2, K.3, M.6, M.9, R.7, S.8.
(Re)

Technical : B.1, F.5, G.4, H.4, K.2, L.3, M.10, R.8, S.3, S.9, S.10, S.12.
(Te)

INTRODUCTORY BOOKS ON OCEANOGRAPHY


- A.1. Allen, J.R.L. *Current Ripples — their Relation to Patterns of Water and Sediment Motion*. T : 2,3 : Ge, Ph North-Holland, 1968, p. 433.
Description of types of ripples on beach sands and sediments underwater and their relation to water motions.
- A.2. Anikouhine, W.A. & R.W. Sternberg. *The World Ocean*. T : 2 : Al Prentice-Hall, 1973, p.338.
A useful general introduction to most aspects of oceanography.
- A.3. Anon., *Atlas of the Oceans*. N,P : 1,2 : Al Rand-McNally, 1977, p. 208.
An encyclopaedia type of atlas.
- A.4. Anon., *Exploring the Deep Frontiers*. N,P : 1 : Al National Geographic Society, 1980, p. 296.
Colourful illustrated description of the oceans.
- B.1. Badgeley, P.C., L. Miloy & L. Childs. *Oceans from Space*. T,P : 2,3 : Ph, Te Gulf Publishing, 1969, p. 234.
Papers from a relatively early symposium on oceanographic observations from aircraft and space craft. Some good pictures. Technical but not mathematical.



- B.2 Barber, N.F. *Water Waves*. N : 1,2 : Ph Wykeham Publishing, 1969, p. 142.
Describes the characteristics of a variety of waves, e.g. wind waves, wakes, surf, etc. A good introduction to waves on water surfaces and below the surface (internal waves). Some mathematics.
- B.3 Bardach, J.E. *Harvest of the Sea*. N : 1,2 : Bi, Re Harper & Row, 1968, p.301.
A narrative introduction to the plankton and fisheries resources of the sea.
- B.4 Bardach, J.E, J.H. Ryther & W.O. McLarney. *Aquaculture*. T : 2,3 : Bi, Re Wiley-Interscience, 1972, p.868.
Detailed accounts of a large variety of aquaculture techniques for fish, shellfish and seaweeds.
- B.5 Barnes, R.S.K. *Coastal Lagoons*. T : 2,3 : Bi, Ge Cambridge University Press, 1980, p.106
An introduction to lagoons — types, formation, circulation, biology and human use.
- B.6 Bascom, W. *A Hole at the Bottom of the Sea*. N : 2 : Ge Doubleday, 1961, p.352.
Interesting presentation of geological oceanography and of the ill-fated 'Mohole' project (a proposal to drill to about 7 km depth in the bottom of the deep oceans).
- B.7 Bascom, W. *Waves and Beaches*. N : 1,2 : Ge, Ph Anchor, 1964, p.267.
A lively account of waves near the shore and of their effects on beaches, from the personal experiences of the author.
- B.8 Behrman, D. *The New World of the Oceans*. N : 1,2,3, : Pe, (Al) Little, Brown, 1969, p.436.
This would be better titled 'Men and the Ocean' as it is primarily about individual scientists and their investigations in recent years — most aspects of oceanography, chiefly at oceanographic research institutions, e.g. Scripps, Woods Hole and Lamont.
- B.9 Behrman, D. *Exploring the Ocean*. N : 1,2 : Al, Pe Unesco, 1970, p.89.
A science writer's general review of marine science.
- B.10 Bhatt, J.J. *Oceanography*. T : 1,2 : Al, Re Van Nostrand, 1978, p.322.
A general introduction to most aspects of oceanography, many illustrations, emphasis on resources of the oceans.



- B.11 Briggs, P. *Water — the Vital Essence*. N : 1,2 : Ph Harper & Row, 1967, p.233.
About man's relationship to water, both fresh and salt. A very general account with a few photographs.
- B.12 Broecker, W.S. *Chemical Oceanography*. T : 2,3 : Ch Harcourt, Brace, 1974, p.214.
An introduction to the subject but needs some chemistry background.
- C.1 Carson, R.L. *The Sea Around Us*. N : 1,2 : Bi, Po Oxford University Press, 1951, p.230.
One of the first of the modern very general accounts of what oceanography, mainly biological, is about. No illustrations.
- C.2 Chapin, H. & F.G.W. Smith. *The Ocean River*. N : 1,2 : Bi, Ph Scribner, 1962, p.325.
A popular account and treatment of the Gulf Stream and of fisheries in the western North Atlantic.
- C.3 Chapman, V.J. & D.J. *Seaweeds and their Uses*. T : 2,3 : Bi, Re Chapman & Hall, 1980, p.334.
A chapter on types of sea weeds but mostly on their uses.
- C.4 Clancy, E.P. *The Tides — Pulse of the Earth*. N : 1,2 : Ph Doubleday, 1968, p.228.
A non-mathematical treatment of ocean tides, with chapters on atmospheric and earth tides.
- C.5 Coker, R.E. *This Great and Wide Sea*. N : 1,2 : Al, (Bi) Chapel Hill, 1947, p.325.
An introduction to most aspects of oceanography with an emphasis on biology. A good introduction despite its age. Illustrated.
- C.6 Cotter, C.H. *The Physical Geography of the Oceans*. T : 1,2 : Ge, Ph Hollis & Carter, 1965, p.317.
An early introduction to what is now called 'oceanography' — mostly geology.
- C.7 Craig, R.E. *Marine Physics*. N : 1,2 : Ph Academic Press, 1972, p. 83.
A very brief introduction to applications of physics to the study of ocean dynamics, acoustics and optics.
- C.8 Cromie, W.J. *Exploring the Secrets of the Sea*. N : 1 : Al Allen & Unwin, 1964, p.300.
An elementary introduction to most aspects of oceanography — very general.

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- C.9 Cushing, D.H. *Marine Ecology and Fisheries*. T : 2,3 : Bi Cambridge University Press, 1975, p.278.
A university level introduction to these subjects.
- D.1 Davis, R.A. *Principles of Oceanography*. T : 2 : Al, Po Addison-Wesley, 1972, p.434.
A review of most aspects of oceanography with good illustrations and selected references for each chapter.
- D.2 Deacon, G.E.R. (Ed.) *Oceans — an Atlas History of Man's Exploration of the Deep*. N,P : 1,2 : Hi, Al Hamlyn, 1962, p.295.
- D.3 Deacon, M. *Scientists and the Sea*. N,P : 1,2,3 : Pe, Hi, (Al) Academic Press, 1971, p.398.
An account of marine scientists and of their contributions to the field.
- D.4 Deacon, M.B. *Oceanography — Concepts and History*. N : 2,3 : Hi, (Al) Dowden, Hutchinson & Ross, 1978, p.394.
An interesting collection of 'benchmark' scientific papers in oceanography from 1666 to 1963 reproduced directly from the original journals. Interesting glimpses of the history of oceanography.
- D.5 Defant, A. *Ebb and Flow*. N : 1,2 : Ph University of Michigan Press, Trans., 1958, p.121.
A very good introduction to the tides of the sea plus chapters on atmospheric and earth tides by an eminent oceanographer, non-mathematical.
- D.6 Drake, C.L., J. Imbrie, J.A. Knauss & K.K. Turekian. *Oceanography*. T : 1,2 : Al, Hi Holt, Rinehart & Winston, 1978, p.447.
An overall introduction to oceanography from history to the present; well illustrated.
- D.7 Duxbury, A.C. *The Earth and its Oceans*. T : 1,2 : Ph (Ge, Po) Addison-Wesley, 1971, p.381.
Principally physical oceanography with chapters on biology, geology and pollution. Study questions.
- E.1 Edmonds, A. *A Voyage to the Edge of the World*. N : 1,2 : Al, Pe McLelland & Stewart, 1973, p.254. (Canadian author).
A somewhat lurid account of the Canadian 'Hudson 70' expedition which



circumnavigated the Americas in one year carrying out a variety of oceanographic studies in the Atlantic, Antarctic, Pacific and Arctic Oceans. (Written by a non-scientist who took no part in the expedition.)

- E.2 Ellis, G.B. *Fresh Water from the Ocean*. T : 2,3 : Ph, Re Ronald, 1954, p.217.
An account of ways to obtain fresh water from sea water — old but the only book on the subject at this level.
- E.3 Ericson, D.B. & G. Wollin. *The Ever-Changing Sea*. N :2 : Al Knopf, 1967, p.354.
A clear account of most aspects of oceanography but very few illustrations.
- F-1 Fairbridge, R.W. (Ed.) *Encyclopaedia of Oceanography*. Encycl. : 2,3 : Al Reinhold, 1966, p.1021. (One volume).
Typical encyclopaedia, well illustrated, rather technical.
- F.2 Fell, B. *Introduction to Marine Biology*. T : 2 : Bi Harper & Row, 1975, p.356.
A well-illustrated, fairly detailed account from plankton to marine mammals.
- F.3 Fichter, G.S. *The Future Sea*. N :1 : Bi, Ge, Re Sterling, 1978, p.168.
A simple account of biological and mineral resources of the sea.
- F.4 Flemming, N.C. *The Undersea*. N,P : 1,2 : Al, Po Cassell, 1977, p.319.
Very colourfully illustrated description of many aspects of the marine sciences.
- F.5 Frey, H. & P. Tsimoulis. *Camera Below*. T : 1,2 : Te Association Press, 1968, p.224.
A review of techniques for underwater photography with good black-and-white illustrations.
- F.6 Friedrich, H. *Marine Biology*. T :3 :Bi University of Washington Press, (Trans.), 1969, p.474.
Plants and animals of the sea from shore to deep abyss.
- G.1 Gaskell, T.F. *Under the Deep Oceans*. N :1 : Ge Norton, 1960, p.240.
A general introduction to geological oceanography — few illustrations but well written.
- G.2 Gaskell, T.F. *The World beneath the Oceans*. N :1 : Ge Aldens, 1967, p.154.
Another introduction to geological oceanography.



- G.3 Gaskell, T.F. *The Gulf Stream*. N : 1 : Ph Cassell, 1972, p.170.
A short account of this ocean current.
- G.4 Geyer, R.A. (Ed.) *Submersibles and their Use in Oceanography and Engineering*. T : 2,3 : Te Elsevier, 1977, p.383.
A rather technical account by a number of specialists.
- G.5 Golden, F. *The Moving Continents*. N : 1 : Ge Scribners, 1972, p.124.
A simple account of continental drift.
- G.6 Groen, P. *The Waters of the Sea*. T : 1 : Ph Van Nostrand, 1967, p.328.
A discussion of ocean circulation, waves and tides, without mathematics.
- G.7 Gross, M.G. *Oceanography*. N : 1 : Al Merrill, 4th Edn., 1980, p.145.
A much briefer account than his other book (G.9).
- G.8 Gross, M.G. *Oceanography — a View of the Earth*. T : 1,2 : Al Prentice-Hall, 3rd Ed., 1982, p.408.
A good descriptive account, well illustrated — probably the best book at this level.
- H.1 Hachey, H.B. *Oceanography and Canadian Atlantic Waters*. T : 2,3 : Ph,Hi Fisheries Research Board of Canada, 1961, p.120. (Canadian author).
Chapters on the history of oceanography and on basic principles, followed by a description of the circulation of the western North Atlantic and of Canadian Atlantic seaboard waters.
- H.2 Harvey, H.W. *The Chemistry and Fertility of Sea Water*. T : 2,3 : Ch,Bi Cambridge University Press, 1955, p.240.
A textbook on the chemistry of sea water and its relation to biological production in the sea — perhaps a bit advanced but a sound introduction.
- H.3 Harvey, J.G. *Atmosphere and Ocean — our Fluid Environment*. T : 2,3 : Ph Artemis, 1976, p.143.
A coherent description of the characteristics and dynamics of the atmosphere and ocean and of their interaction, with simple mathematical developments.
- H.4 Hass, H. *Men beneath the Sea*. N : 1 : Bi, Te St. Martins Press, 1973, p.407.
Mainly about SCUBA diving, many illustrations.




- H.5 Heezen, B.C. & C.D. Hollister. *The Face of the Deep*. T,P : 2,3 : Ge Oxford University Press, 1971, p.659.
Rather technical but has a vast number of fascinating photographs of the deep sea bottom.
- H.6 Heintze, C. *The Bottom of the Sea and Beyond*. N : 1 : Ge Nelson, 1975, p.144.
A simple account of studies of the ocean bottom, 'Mohole', etc.
- H.7 Hela, I. & T. Laevastu. *Fisheries Hydrography*. T : 2 : Ph (Bi) Fishing News (Books) Ltd., 1961, p.137.
How studies of oceanography (sometimes called 'hydrography' in England) and meteorology can and do serve fisheries. Rather technical but one of the few books describing the relations between physical studies and biological productivity and resources.
- H.8 Heering, P.J. & M.R. Clarke (Eds.) *Deep Oceans*. N,P : 1,2 : Bi Praeger, 1971, p.320.
A series of well-illustrated articles, mainly on the biology of the sea.
- H.9 Hidy, G.M. *The Waves*. T : 1 : Ph Van Nostrand, 1971, p.150.
A misleading title as the book is mainly about the ocean circulations with one chapter on waves — a few formulae but little mathematics.
- H.10 Horsfield, B. & P.B. Stone. *The Great Ocean Business*. N : 1,2 : Al, Hi Coward, McConn & Geoghegan, 1972, p.360.
An interesting account of the development of oceanography and of the objectives and character of a number of ocean studies, i.e. what oceanography is about. A few illustrations.
- H.11 Hull, S. *The Bountiful Sea*. N : 1 : Re (Al) Prentice-Hall, 1964, p.340.
Mostly it attempts to relate ocean studies to possible technological advances and benefits for man.
- I.1 Idyll, C.P. *Abyss — the Deep Sea and Creatures that live in it*. N,P : 1 : Bi Crowell, 1964, p.428.
The title tells it all — illustrated.
- I.2 Idyll, C.P. *The Sea against Hunger*. N : 1,2 : Bi, Re Crowell, 1970, p.221.
Mainly about fisheries, some illustrations.



- I.3a Idyll, C.P. (Ed.) *The Science of the Sea — a History of Oceanography*. N:P : 1,2 : Hi (Al) Nelson, 1970, p.280.
A history of oceanography and various aspects of the science by a series of experts in their fields. Chapters on biological and mineral resources, ecology, archeology, etc. Well illustrated.
- I.3b Idyll, C.P. (Ed.) *Exploring the Ocean World*. Crowell, 1972, p.296.
The same book as the previous one (I.3a) despite the different title, etc.
- I.4 Ingmanson, D.E. & W.J. Wallace. *Oceanography — an Introduction*. N : 1,2 : Bi, Po Wadsworth, 2nd Edn., 1979, p.357.
Well-illustrated descriptive account of the oceans. Good chapter on pollution and use of the sea. The sea as a biological environment.
- K.1 Keen, M.J. *An Introduction to Marine Geology*. T : 2,3 : Ge Pergamon, 1968, p.218. (Canadian author).
A description of the structure and sediments of the ocean basins written for the non-specialist. Illustrated.
- K.2 Kelly, S. *Experimental Oceanography*, N : 2,3 : Te (Al) Sams, 1975, p.221.
A simple introduction to oceanographic techniques and equipment.
- K.3 Kent, P. *Minerals from the Marine Environment*. N : 1,2 : Ge, Re Arnold, 1980, p.88.
A brief introduction to this topic.
- K.4 King, C.A.M. *Introduction to Oceanography*. T : 2 : Al McGraw-Hill, 1963, p.337.
Ocean basins, geomorphology and sediments, physical oceanography and a chapter on biology. (Many factual errors in the physics and biology.)
- K.5 King, C.A.M. *Beaches and Coasts*. T : 2,3 : Ge Arnold, 2nd Edn., 1972, p.403.
A thorough treatment but unfortunately has few photographs for a subject that really needs lots.
- L.1 Laurie, A. *The Living Oceans*. N : 1 : Bi (Ph) Doubleday, 1973, p.187.
A well-illustrated introduction to the biology of the oceans with a little physical oceanography.
- L.2 Limburg, P.R. *Oceanographic Institutions*. N : 1,2 : Al Elsevier, 1979, p.265.
Descriptions of U.S. institutions and of their work, with brief reference to other countries and to training for the field.



- L.3 Limburg, P.R. & J.B. Sweeney. *Vessels for Underwater Exploration*. T : 1,2 : Hi, Te Crown, 1973, p.154.
Submarines and submersibles from the earliest days, well illustrated.
- L.4 Lucas, J. & P. Critch. *Life in the Oceans*. N : 1 : Bi Thames & Hudson, 1974, p.216.
Introduction to life in the sea, especially marine mammals, fishing.
- M.1 Macmillan, D.H. *Tides*. T : 2 : Ph Elsevier, 1966, p.240.
A general description of ocean tides, their measurement, tidal energy schemes and miscellaneous related topics. A little mathematics.
- M.2 Marvin. U.B. *Continental Drift*. T : 1,2 : Ge Smithsonian Institution, 1973, p.239.
A more detailed account of this subject than that by Golden (G.5), well illustrated.
- M.3 Maury, H.F. *The Physical Geography of the Sea*. N : 2,3 : Ph (Hi) Harper, 1859, p.389.
Why include such an early text (the First Edition was dated 1855)? Because it is a classic and probably the earliest systematic text on physical oceanography. Based on information gathered from mariners.
- M.4 Maxwell, W.G.H. *Atlas of the Great Barrier Reef*. T : 1,2,3 : Ge, Ph Elsevier, 1968, p.258.
The most complete description of the topography, geology and physical oceanography of a major coral reef region. Well illustrated.
- M.5 McCormick, J.M. & J.V. Thiruvathakal. *Elements of Oceanography*. T : 1,2 : Al (Ph) Saunders, 1976, p.346.
An introduction to most aspects of oceanography from history to resources, emphasis on physical oceanography. Well illustrated.
- M.6 McKee, A. *Farming the Sea* N : 1,2 : Bi, Re Souvenir, 1967, p.314.
Chiefly about ocean fisheries, illustrated.
- M.7 McLellan, H.J. *Elements of Physical Oceanography*. T : 2,3 : Ph Pergamon, 1965, p.150.
An introduction to descriptive and dynamical oceanography, mathematical.
- M.8 Menard, H.W. *Anatomy of an Expedition*. N : 1,2,3 : Ge, Pe McGraw-Hill, 1969, p.255.
Excellent description of an expedition to study geological oceanography




problems in the western South Pacific with special reference to atolls, starting with initial plans and through to comments on the value of the results.

- M.9 Mero, J.L. *The Mineral Resources of the Sea*. T : 2,3 : Ge, Re Elsevier, 1965, p.312.
A review of the title topic — perhaps a little dated but the best introduction to the subject.
- M.10 Mertens, L. *In-Water Photography*. T : 2,3 : Te, Ph Wiley-Interscience, 1970, p.391.
A more technical account of underwater optics and photography than that by Frey & Tsimoulis (F.5).
- M.11 Miller, R.C. *The Sea*. N,P : 1 : Al Random House, 1966, p.316.
A general account of most aspects of the sea, well illustrated.
- M.12 Moorcraft, C. *Must the Seas Die?* N : 1,2 : Po Gambit, 1973, p.194.
A simple discussion of pollution of the ocean.
- O.1 Orr, A.P. & S.M. Marshall. *The Fertile Sea* N : 1,2 : Bi Fishing News (Books), Ltd., 1969, p.131.
Mostly about phyto- and zooplankton, by two world experts.
- P.1 Perry, A.H. & J.M. Walker. *The Ocean-Atmosphere System*. T : 2,3 : Ph Longman, 1977, p.160.
An excellent account of the two fluid components of our earth, well illustrated.
- P.2 Pettersson, H. *Westward Ho with the Albatross*, N : 1,2 : Ge, Pe Dutton, 1953, p. 209.
A general account of an oceanographic expedition, mainly geological.
- P.3 Pettersson, H. *The Ocean Floor*. N : 1 : Ge Yale University Press, 1954, p.181.
A simple account of marine geology; from a lecture series.
- P.4 Piccard, J. *The Sun beneath the Sea*. N : 1,2 : Al Scribners, 1971, p.405.
An account of the submarine drift voyage of the mesoscaphe (submersible) in the Gulf Stream.
- P.5 Pickard, G.L. & W.J. Emery. *Descriptive Physical Oceanography*. T : 1,2,3 : Ph Pergamon, 4th Edn., 1982, p.249 (Canadian author).
A description of the distributions of temperature and salinity in the oceans



and of the factors which determine these distributions; circulation of the individual oceans. Illustrated. Non-mathematical.

- P.6 Pounder, E.R. *Physics of Ice*. T : 2,3 : Ph Pergamon, 1965, p.151. (Canadian author).
A useful introduction to the properties and distributions of fresh water ice and sea ice.
- R.1 Raitt, H. *Exploring the Deep Pacific*. N : 1,2 : Ge, Pe Norton, 1956, p.272.
An interesting account of the action during a geological oceanography expedition through the eyes of a woman (wife of one of the scientists) who was on the ship.
- R.2 Raitt, H. & H.B. Moulton, *Scripps Institution of Oceanography: the First Fifty Years*. N : 1,2 : Al, Pe Ward Ritchie, 1967, p.217.
An account of oceanographic studies at and personnel of the Scripps Institution of Oceanography, California.
- R.3 Reish, D.J. (Ed.) *Biology of the Oceans*. T : 2,3 : Bi Dickenson, 1969, p.236.
An introduction to the subject with articles by a large number of experts; from the intertidal zone to the deep ocean.
- R.4 Ricketts, E.F. & J. Calvin. *Between Pacific Tides*. T : 1,2,3 : Bi Stanford University Press, 3rd Edn., 1968, p.502.
An excellent account of the plants and creatures found along the Pacific shore — a classic.
- R.5 Roessler, C. *The Underwater Wilderness*. N,P : 1,2 : Bi Chanticleer, (undated, probably 1977), p.319.
Excellent colour photographs of coral reefs and fishes around the world, with explanatory text.
- R.6 Ross, D.A. *Introduction to Oceanography*. T : 1,2 : Al Appleton-Century-Crofts, 1970, p.384; Prentice-Hall, 3rd Edn., 1982, p.528.
A good review of most aspects of oceanography, well illustrated.
- R.7 Ross, D.A. *Opportunities and Uses of Oceanography* T : 2,3 : Re, Po Springer-Verlag, 1978, p.320.
Use of the ocean for shipping and for its resources, and the problems of pollution. Marine law. Illustrated.

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- R.8 Ross, F. *Undersea Vehicles and Habitats*. N : 1,2 : Te Crowell, 1970, p.183.
A brief account of these subjects.
- R.9 Russell, R.C.H. & D.H. Macmillan. *Waves and Tides*. T : 2 : Ph Hutchinson, 1952, p.348.
A general treatment with little mathematics, illustrated.
- R.10 Russell, F.S. & C.M. Yonge, *The Seas*. N : 1,2 : Bi Warne, 1963, p.376.
An early review emphasizing biology, some illustrations.
- S.1 Schlee, S. *The Edge of an Unfamiliar World — a History of Oceanography*. N : 1,2,3 : Hi (Al) Dutton, 1973, p.397.
Mainly about oceanographic studies in the Atlantic. A good source for the history of the subject from the 1800's to 1970.
- S.2 Schlee, S. *On Almost any Wind*. N : 1,2 : Al, Pe Cornell University Press, 1978, p.301.
A very interesting account of the work of the Woods Hole Oceanographic Institution's research vessel *Atlantis* and of those who sailed in her.
- S.3 Shenton, E.H. *Diving for Science*. N : 2 : Te Norton, 1972, p.267.
About submersibles used for research; detailed but not highly technical, some photographs.
- S.4 Shepard, F.P. *The Earth beneath the Sea*. T : 2 : Ge Johns Hopkins Press, 1959, p.242.
An introduction to marine biology, well illustrated.
- S.5 Shepard, F.P. *Geological Oceanography*. T : 1,2 : Ge Crane, Russak, 1977, p.214.
A very well-illustrated account of many recent developments in this field by an expert. Many colour plates. Probably the best book at this level.
- S.6 Shor, E.N. *Scripps Institution of Oceanography — Probing the Oceans, 1936-1976*. N : 1,2,3 : Al, Pe Tofua Press, 1978, p.502.
An account of a wide range of oceanographic activities at the Scripps Institution of Oceanography and of the people who took part.
- S.7 Silverberg, R. *The World within the Ocean Wave*. N : 1 : Bi Weybright & Talley, 1972, p.114.
A simple introduction to plankton and fishes in the sea (not just in waves!).



- S.8 Skinner, B.J. & K.K. Turekian. *Man and the Ocean*. N : 1,2 : Re, Po Prentice-Hall, 1973, p.149.
An introduction to the resources of the ocean, mainly mineral ones, desalination, pollution. Illustrated.
- S.9 Soule, G. *The Ocean Adventure*. N : 1 : Te Appleton-Century, 1966, p.278.
A general, simple account of some studies of the sea and of man in the sea in submersibles.
- S.10 Soule, G. *Undersea Frontiers*. N : 1,2 : Te Rand McNally, 1968, p.253.
About man working below the sea surface, submersibles, etc. Photographs.
- S.11 Spar, J. *Earth, Sea and Air*. T : 1 : Ge, Ph Addison-Wesley, 1962, p.152.
A general introduction to the solar system, the solid earth and the oceans and atmosphere.
- S.12 Sténuit, R. *The Deepest Days*. N : 1 : Te Coward-McCann, 1966, p.222.
A brief account of underwater habitats, very few photographs.
- S.13 Stommel, H. *The Gulf Stream*. T : 3 : Ph University of California Press, 2nd Edn., 1965, p.248.
A description of this ocean current and a review of theoretical studies of it. An excellent introduction to physical oceanography for a science student. Mathematical.
- S.14 Stowe, K.S. *Ocean Science*. T : 1,2 : Al Wiley, 1979, p.610.
An extensive general introduction to most aspects of oceanography, illustrated. Sets of questions at the end of each chapter.
- T.1 Tait, R.W. *Elements of Marine Ecology*. T : 2 : Bi, Po Butterworth's, 2nd Edn., 1972, p.314.
An introduction to the subject; some physics but mostly plankton and fisheries.
- T.2 Teal, J. & M. *The Sargasso Sea*. N : 1 : Bi Little, Brown, 1975, p.216.
A simple account of the biology of the middle North Atlantic.
- T.3 Thomas, M.L.H. *Introducing the Sea*. N : 1 : Al Huntsman Marine Laboratory, Canada, 1973, p.202. (Canadian author).
A very simple account of some aspects of oceanography; emphasis on biology.



- T.4 Thomson, R.E. *Oceanography of the British Columbia Coast*. T : 1,2,3 : Ph, Ge Department of Fisheries and Oceans, Ottawa, 1981, p.291. (Canadian author). An excellent account of most aspects of the physical oceanography of a coastal region, with some background geology. Very well illustrated, not mathematical. Written for yachtsmen and all others interested in the sea. A 'Best Buy'.
- T.5 Thorson, G. *Life in the Sea*. T : 1 : Bi McGraw Hill, 1971, p.256. A good introduction to marine plankton and fishes, etc., fish farming. Illustrated.
- T.6 Thurman, H.V. *Introductory Oceanography*. T : 1,2 : Al Merrill, 3rd Edn., 1981, p.464. A very well illustrated introduction to most aspects of oceanography.
- T.7 Tricker, R.A.R. *Bores, breakers, waves and wakes*. N : 1,2 : Ph Elsevier, 1965, p.250. An interesting account of waves near the shore and of bores in rivers.
- T.8 Turekian, K.K. *Oceans*. N : 1 : Ch, Ge, Ph Prentice-Hall, 2nd Edn., 1976, p.120. A brief introduction to the chemistry, geology and physics of the oceans.
- V.1 Van Andel, T. *Tales of an Old Ocean*. N : 1,2 : Al Norton, 1977, p.175. A good general introduction to many aspects of oceanography in a conversational style, few illustrations.
- V.2 Van Dorn, W.G. *Oceanography and Seamanship*. T : 1,2 : Ph Dodd Mead, 1974, p.481. An interesting and simply written account of how knowledge of the ocean is applied to practical seamanship.
- V.3 Various. *Oceanography — Readings from 'Scientific American'*. N : 1,2 : Al Freeman, 1971, p.417. A collection of stimulating articles on many aspects of oceanography written by experts and well illustrated in the usual *Scientific American* style.
- V.4 Various. *Ocean Science — Readings from 'Scientific American'*. N : 1,2 : Al Freeman, 1977, p.307. Contains articles additional to those in the previous reference (V.4).
- V.5 Various. *Life in the Sea*. N : 1,2 : Bi Freeman, 1982, p.248. Articles from *Scientific American* by experts on the biology of the sea.



- V.6 Vogel, S. *Life in Moving Fluids*. T : 2,3 : Ph (Bi) Willard Grant, 1981, p.352.
Not oceanography as such but an entertaining and unusual book about the interrelationships between fluid motions and biological organisms moving in water and air. Not mathematical.
- W.1 Walton Smith, F.G. *The Seas in Motion*. N : 1 : Ph Crowell, 1973, p.248.
A simple account of the motions of the oceans — illustrated.
- W.2 Weisberg, J. & H. Parish. *Introductory Oceanography*. T : 1 : Al McGraw-Hill, 1974, p.320.
A general introduction with an emphasis on geology and physics; a little on biology and on ocean-atmosphere interaction. No mathematics.
- W.3 Weyl, P.K. *Oceanography*. T : 2 : Al Wiley, 1970, p.535.
Most aspects of oceanography with an emphasis on physics and chemistry. Well illustrated.
- W.4 Williams, J. *Oceanography*. T : 2 : Ph Little Brown, 1962, p.242.
An introduction to physical oceanography with some mathematics; chapters on biology, chemistry and geology. (Unfortunately there are numerous errors).
- W.5 Williams, J., J.J. Higginson & J.D. Rohrbough. *Sea and Air*. T : 1,2 : Ph McGraw-Hill, 1968, p.338.
A general introduction to meteorology and physical oceanography. No mathematics.
- W.6 Wyllie, F.E. *Tides and the Pull of the Moon*. N : 1 : Ph Stephen Greene, 1979, p.246.
A misleading title — it has something about tides but also material about non-tidal waves, e.g. storm surges, tsunamis, etc.
- Y.1 Yasso, W.E. *Oceanography*. N : 1 : Al Holt, Rinehart, 1965, p.176.
A brief account of most aspects of oceanography.



MORE ADVANCED TEXTS

The following titles include a selection of more advanced texts (used in senior university or graduate courses) to enable a third or fourth year university student to get some idea of the knowledge available about the oceans and the kind of problems being studied. Any student who wishes to get the most up-to-date information should look at recent copies of the scientific journals listed in the references in these texts. The books are given in chronological order of publication.

Biology

- Bi.1 Sverdrup, H.U., M.W. Johnson and R.H. Fleming. *The Oceans, their Physics, Chemistry and general Biology*. Prentice-Hall, 1946, p.1082.
A comprehensive reference text on all aspects of oceanography to that date. (It includes some sedimentary geology.)
- Bi.2 Marshall, N.B. *Aspects of Deep-Sea Biology*. New York Philosophical Library, 1954, p.380. A classic but well worth reading for a start.
- Bi.3 Hardy, A.C. *The Open Sea: Vol. 1, Plankton*, p.335; *Vol. 2, Fishes*, p.322. Houghton Mifflin, 1956.
- Bi.4 Hill, M.N. (Ed.). *The Sea — Ideas and Observations*. Wiley-Interscience, Vol. 2, *The Composition of Sea-Water; Comparative and Descriptive Oceanography*, 1963, p.554.
- Bi.5 Steele, J.H. (Ed.) *Marine Food Chains*. Oliver & Boyd, 1970, p.552.
- Bi.6 Costlow, J.D. (Ed.) *Fertility of the Sea*. Gordon & Breach, 1971, p.308.
- Bi.7 Cushing, D.H. & J.J. Walsh, (Eds.). *The Ecology of the Seas*. Saunders, 1976, p.467.
- Bi.8 Parsons, T.R., M. Takahashi & B. Hargrave. *Biological Oceanographic Processes*. Pergamon, 2nd. Edn. 1977, p.332. (Canadian authors).
- Bi.9 Barnes, R.K. and K.H. Mann, (Eds.) *Fundamentals of Aquatic Ecosystems*. Blackwell, 1980, p.229. (Canadian authors).
- Bi.10 Raymont, J.E.G. *Plankton and Productivity in the Oceans*, Vol. 1, *Phytoplankton*, Vol. 2, *Zooplankton*. Pergamon, 1980, p.660.



Chemistry

- Ch.1 Sverdrup, H.U., M.W. Johnson & R.H. Fleming. *The Oceans*. (see Bi.1)
- Ch.2 Hill, M.N. (Ed.). *The Sea — Ideas and Observations*, Vol. 2 (see Bi.4)
- Ch.3 Horne, R.A. *Marine Chemistry*, Wiley-Interscience, 1969, p.568.
- Ch.4 Riley, J.P. & R. Chester. *Introduction to Marine Chemistry*. Academic Press, 1971, p.465. A good introduction at university level.
- Ch.5 Hood, D.W. (Ed.) *Impingement of Man on the Oceans*. Wiley-Interscience, 1971, p.738. Articles by specialists on biology, chemistry, geology and pollution.
- Ch.6 Riley, J.P. & G. Skirrow (Eds.) *Chemical Oceanography*. Academic Press, 2nd Edn., 6 volumes, 1975, 1976. An advanced text by a series of specialists.
- Ch.7 Dyrsson, D. & D. Jagner (Eds.) *The Changing Chemistry of the Oceans*. Wiley-Interscience, 1972, p.364. Proceedings of the 20th Nobel Symposium.
- Ch.8 Johnston, R. (Ed.) *Marine Pollution*. Academic Press, 1976, p.729. A series of long articles on this subject.
- Ch.10 Laws, E.A. *Aquatic Pollution*. Wiley-Interscience, 1981, p.482.

Geology

- Ge.1 Sverdrup, H.U., M.W. Johnson & R.H. Fleming. *The Oceans*. (see Bi.1)
- Ge.2 Kuenen, Ph.H. *Marine Geology*. Wiley, 1950, p.568. A general textbook on marine geology — somewhat dated now but useful.
- Ge.3 Emery, K.O. *The Sea off Southern California*. Wiley, 1960, p.366. A description of this area with emphasis on marine geology.
- Ge.4 Hill, M.N. (Ed.) *The Sea — Ideas and Observations*. Wiley-Interscience, Vol.3, *The Earth beneath the Sea*, 1963, p.963. Early studies and history.
- Ge.5 Shepard, F.P. *Submarine Geology*. Harper & Row, 2nd Edn., 1963, p.557.



- Ge.6 Menard, H.W. *Marine Geology of the Pacific*. McGraw-Hill, 1964, p.271.
- Ge.7 Maxwell, A.E. (Ed.) *The Sea — Ideas and Observations*. Wiley-Interscience, Vol. 4, *New Concepts of Sea Floor Evolution*, 1970, Part 1, p.791, Part 2, p.664.
- Ge.8 Emiliani, C. (Ed.). *The Sea — Ideas and Observations*. Wiley-Interscience, Vol. 7, *The Oceanic Lithosphere*, p.1738.
- Ge.9 Kennett, J.P. *Marine Geology*. Prentice-Hall, 1982, p.813. A comprehensive, recent text, many references.

Physics

- Ph.1 Sverdrup, H.U., M.W. Johnson & R.H. Fleming. *The Oceans*. (see Bi.1).
- Ph.2 Defant, A. *Physical Oceanography*. Pergamon, 1961, p.1319. Vol. 1, Pt. 1 is descriptive, Pt.2 is dynamical (steady state); Vol. 2 is all dynamical (time-varying aspects, e.g. waves, tides).
- Ph.3 Hill, M.N. (Ed.) *The Sea — Ideas and Observations*. Wiley-Interscience, Vol. 1, *Physical Oceanography*, 1962, p.864.
- Ph.4 Stommel, H. *The Gulf Stream*. University of California Press, 2nd Edn., 1965, p.248. A good introduction to basic physical oceanography.
- Ph.5 Lacombe, H. *Cours d'Océanographie Physique*. Gauthier-Villars, Paris, 1965, p.392. The classical approach to dynamical oceanography.
- Ph.6 Neumann, G. & W.J. Pierson. *Principles of Physical Oceanography*. Prentice-Hall, 1966, p.545. Mainly dynamical with one chapter on descriptive physical oceanography.
- Ph.7 Goldberg, E.D. *et al.*, *The Sea — Ideas and Observations*. Wiley-Interscience, Vol. 6, *Marine Modelling*, 1977, p.1048. About numerical modelling of a variety of oceanic systems.
- Ph.8 LeBlond, P.H. & L.A. Mysak. *Waves in the Ocean*. Elsevier, 1978, p.602. An advanced review of surface and internal wave studies of the ocean. (Canadian authors).



- Ph.9 Dietrich, G., K. Kalle, W. Krauss & G.Siedler. *General Oceanography — An Introduction*. Wiley-Interscience, 2nd Edn. (Trans.), 1980, p.626. A comprehensive text on physical oceanography with summaries of other disciplines. Not quite as up-to-date as it could have been.
- Ph.10 Warren, B.A. & C. Wunsch (Eds.) *Evolution of Physical Oceanography*. MIT Press, 1981, p.623. An excellent series of survey articles on most aspects of physical oceanography, tracing the development of the fields and laying out the state of our knowledge to that date.
- Ph.11 Gill, A.E. *Atmosphere-Ocean Dynamics*. Academic Press, 1982, p.688. A unified comprehensive approach to the study of oceanic and atmospheric circulations and interactions. An excellent advanced text.
- Ph.12 Pond, S. & G.L. Pickard. *Introductory Dynamical Oceanography*. Pergamon, 2nd Edn., 1983. The basics plus chapters on numerical modelling, waves, tides, etc. Uses SI units. (Canadian authors).

Il existe également sur le même sujet une bibliographie en français.

Published By:

Communications Directorate
Department of Fisheries and Oceans
Ottawa, Ontario
K1A 0E6

DFO/1890

Minister of Supply and Services
Canada 1984
Catalogue Number Fs 23-60/1984E
ISBN 0-662-13460-5



